



Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775
Tel 225-381-4157

William F. Maguire
Site Vice President

RBG-47791

October 12, 2017

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Licensee Event Report 50-458 / 2017-008-00
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-17-0119

Dear Sir or Madam:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report. This document contains no commitments. If you have any questions, please contact Mr. Tim Schenk at 225-381-4177.

Sincerely,

A handwritten signature in black ink, appearing to read "W. F. Maguire", with a large, stylized loop at the bottom.

WFM / dhw

Enclosure

cc: U. S. Nuclear Regulatory Commission
Region IV
1600 East Lamar Blvd.
Arlington, TX 76011-4511

NRC Sr. Resident Inspector
P. O. Box 1050
St. Francisville, LA 70775

INPO
(via ICES reporting)

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Central Records Clerk
Public Utility Commission of Texas
1701 N. Congress Ave.
Austin, TX 78711-3326

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
Ji Young Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

NRC FORM 366 (04-2017)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 03/31/2020			
LICENSEE EVENT REPORT (LER) (See Page 2 for required number of digits/characters for each block)										
(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)										
1. FACILITY NAME River Bend Station – Unit 1					2. DOCKET NUMBER 05000-458			3. PAGE 1 OF 3		
4. TITLE Automatic Reactor Scram due to Failure of Main Feedwater Regulator Transfer Relay										
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE		8. OTHER FACILITIES INVOLVED		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	
08	18	2017	2017	008	00	10	12	2017	DOCKET NUMBER 05000	
									FACILITY NAME	
									DOCKET NUMBER 05000	
9. OPERATING MODE		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
1		<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)		
		<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)		
		<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)		
		<input type="checkbox"/> 20.2203(a)(2)(i)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)		
10. POWER LEVEL		<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)		
		<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)		
		<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(1)		
		<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(2)(i)		
		<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(ii)		
		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> OTHER		Specify in Abstract below or in NRC Form 366A				
12. LICENSEE CONTACT FOR THIS LER										
LICENSEE CONTACT Tim Schenk, Manager – Regulatory Assurance								TELEPHONE NUMBER (Include Area Code) 225-381-4177		
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT										
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	
D	SJ	83	Agastat	yes						
14. SUPPLEMENTAL REPORT EXPECTED						15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) On August 18, 2017, at 8:55 p.m. CDT, an automatic reactor scram occurred while the plant was operating at 100 percent power. The operators promptly established control of reactor water level and pressure, and a controlled plant cooldown was commenced. The initial scram signal was a flow-biased thermal power trip on the average power range monitors. This action closely followed a planned shift of the master feedwater controller from channel "B" to channel "A." Troubleshooting discovered that the feedwater level channel select relay had failed such that no signal was present on the "A" channel. When that channel was selected, the feedwater system erroneously sensed that reactor water level was low, and caused all three feedwater regulating valves to move fully open. At the same time, the false low water level signal was sensed in the control circuitry for the reactor recirculation system, resulting in an automatic shift of the recirculation pumps to slow speed. The resultant decrease in core flow caused the flow-biased thermal power trip in the average power range monitors, actuating the reactor scram. The failed feedwater system relay was replaced with an updated model with gold contacts. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(iv) as an event resulting in the automatic actuation of the reactor protection system.										

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
River Bend Station – Unit 1	05000-458	YEAR	SEQUENTIAL NUMBER	REV NO.
		2017	008	00

NARRATIVE**REPORTED CONDITION**

On August 18, 2017, at 8:55 p.m. CDT, an automatic reactor scram occurred while the plant was operating at 100 percent power. The operators promptly established control of reactor water level and pressure, and a controlled plant cooldown was commenced. No safety-related equipment was out of service at the time of the scram.

The initial scram signal was a flow-biased thermal trip on the average power range monitors (APRMs). This action closely followed a planned shift of the master feedwater [SJ] controller from channel "B" to channel "A." When the shift was made, all three main feedwater regulating valves unexpectedly moved fully open. At the same time, the reactor recirculation pumps shifted to slow speed.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(iv) as an event resulting in the automatic actuation of the reactor protection system.

INVESTIGATION and CAUSAL ANALYSIS

At the time of the event, operators were performing a planned shift of the controlling channel of the master feedwater regulation system as part a scheduled surveillance test on the system.

Troubleshooting discovered that the feedwater level channel select relay (**83**) had failed, such that no signal was present on the "A" channel. When that channel was selected, the feedwater control system erroneously sensed that reactor water level was low, and caused all three feedwater regulating valves to move fully open. The operator took manual control of the system to restore the feedwater regulating valves to their original positions.

The false low water level signal was also sensed in the control circuitry for the reactor recirculation system. This initiated the automatic downshift of the recirculation pumps to slow speed, as designed. The decrease in core flow resulted in the flow-biased thermal trip in the APRMs.

The failure in the channel select relay was traced to degradation in the electrical contacts on the relay that caused a high resistance condition. This condition also masked an alarm that could have potentially alerted the operator to the fact that the "A" channel was inoperative.

The high resistance condition on the contacts was caused by the use of a relay model with silver contacts instead of gold contacts. Industry operating experience had shown that the Agastat GPI (silver contact) relay, when used in low-current applications, had a tendency to develop contact point oxidation that increased electrical resistance. A parts interchangeability evaluation had been performed in the past at River Bend to approve the Agastat GPIA with gold contacts as a replacement part. However, when that evaluation was performed, the part number for the model GPIA was added to the appropriate design documentation, but the part number for the GPI was not deleted.



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River Bend Station – Unit 1	05000-458	YEAR 2017	SEQUENTIAL NUMBER 008	REV NO. 00

CORRECTIVE ACTIONS TO PREVENT RECURRENCE

The failed GPI relay was replaced with a GPIA with gold contacts.

Design documentation for the feedwater regulation system will be updated to reflect the model GPIA as the required replacement part. This is being tracked in the corrective action program.

PREVIOUS OCCURRENCE EVALUATION

No events with a common root cause have been reported by River Bend Station in the last three years.

SAFETY SIGNIFICANCE

The plant response was bounded by the event described in the Updated Safety Analysis Report as a loss of the in-service feedwater level transmitter signal. This event was thus of minimal significance to the health and safety of the public.

(NOTE: Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER are annotated as (**XX**) and [XX], respectively.)